

REMARKS

Please reconsider the application in view of the above amendments and the following remarks. Applicant thanks the Examiner for carefully considering this application.

Drawings

Applicant respectfully requests that the Examiner accepts the drawings submitted on February 28, 2005. Applicant submits that these drawings are formal.

Disposition of Claims

Claims 1-19 were pending in this application. By way of this reply, claims 1 and 6 have been amended, and claims 14-19 have been canceled. In particular, claim 6 has been rewritten in independent form. Thus, claims 1-13 are currently pending. Claims 1 and 6 are independent. The remaining claims depend, directly or indirectly, from claims 1 and 6.

Claim Amendments

Claim 1 has been amended to include a limitation from claim 6, *i.e.*, the “zigzag pattern.” Claim 6 has been rewritten in independent form without substantive amendments. Claims 14-19 have been canceled without prejudice or disclaimer.

No new matter has been added by way of these amendments. In addition, Applicant respectfully notes that no new search is necessary with respect to amended independent claim 1 because the limitation “zigzag pattern” has already been searched with respect to claim 6. This is evidenced by the fact that, as the Examiner admits in the instant Office Action (page 5, lines 1-2), “Hisashi does not explicitly disclose that each group having an array of light emitting elements placed in a zigzag pattern.” Further, no new search is necessary

with respect to amended claim 6, as claim 6 is merely rewritten in independent form including all limitations of claims 1 and 2 in their un-amended form. Accordingly, entry and favorable consideration of these amendments are respectfully requested.

Rejections under 35 U.S.C. § 102

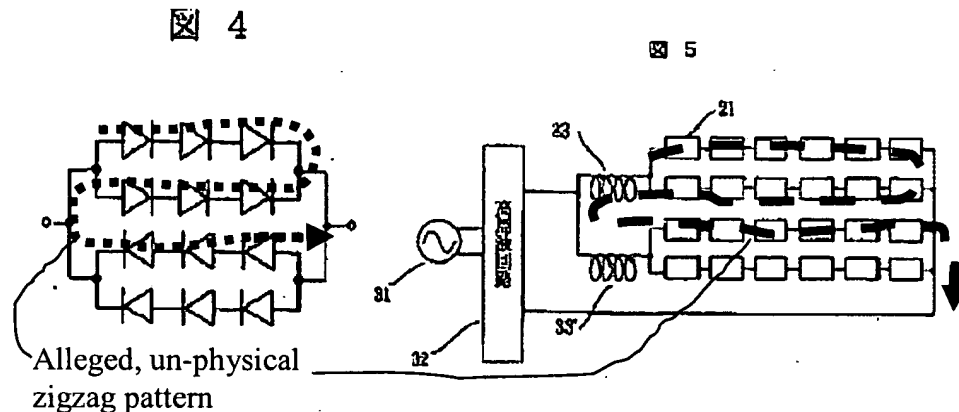
Claims 1-3, 5, and 10-11 stand rejected under 35 U.S.C. 102(b) as being anticipated by JP 2001-307506 (“Hisashi”). By way of this reply, claim 1 has been amended as explained above. To the extent that this rejection may still apply to the amended claims, the rejection is respectfully traversed.

The claimed invention is directed to a light emitting device. Amended independent claim 1 requires, in part, that a plurality of light emitting elements are monolithically formed, and that the plurality of light emitting elements form two groups, within each of the two groups the light emitting elements being connected in series *and forming a zigzag pattern*.

Hisashi, in contrast to the claimed invention, fails to show or suggest at least the above-mentioned limitations.

In the instant Office Action (page 3, lines 18-19), the Examiner asserts that Hisashi discloses, in Figs. 4 and 5, a plurality of light emitting elements arranged in a zigzag pattern. This is incorrect. The non-existence of a zigzag pattern in Hisashi is further evidenced in the instant Office Action (page 5, lines 1-2), wherein the Examiner admits that “Hisashi does not explicitly disclose that each group having an array of light emitting elements placed in a zigzag pattern.”

Referring to Figs. 4 and 5 of Hisashi, reproduced below, the plurality of light emitting elements are *merely connected in parallel*. Had these patterns been construed as zigzag patterns, within a group or not, electrons would be traveling against the force of electric field, and laws of physics would have been violated.



The Examiner's misinterpretations of Hisashi are also evident in construing Fig. 1. In the instant Office Action (page 3, lines 1-3), the Examiner asserts that Hisashi discloses "a light emitting device wherein a plurality of GaN-based light emitting elements 3, 5 and 6 are formed on an insulating substrate 2, and the plurality of light emitting elements (figs. 4 and 5) are monolithically formed ..." These statements are also incorrect.

Referring to Fig. 1 of Hisashi, the purported light emitting elements are, in fact, the GaN buffer layers (3 and 3'), the Si-doped AlGaIn n-cladding layers (5 and 5'), and the GaN barrier layers (6 and 6'). These are merely layers (components) of a light emitting element, not the light emitting elements themselves as the Examiner has construed.

In addition, referring to, *e.g.*, paragraph [0017] of Hisashi, it is clearly stated that the “connection in series” refers to the bonding of electrodes by a gold line and the like, indicating that the light emitting elements are not formed monolithically.

In view of the above, Hisashi fails to show or suggest the claimed invention as recited in independent claim 1 of the present application. Thus, independent claim 1 of the present application is patentable over Hisashi for at least the reasons set forth above. Dependent claims 2-3, 5, and 10-11 are patentable for at least the same reasons. Accordingly, withdrawal of this rejection is respectfully requested.

Rejections under 35 U.S.C. § 103

Claim 4

Claim 4 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Hisashi in view of U.S. Patent No. 5,986,324 (“Adlerstein”). For the following reasons, this rejection is respectfully traversed.

As noted above, Hisashi fails to show or suggest the claimed invention as recited in independent claim 1 of the present application. Adlerstein, like Hisashi discussed above, also fails to show or suggest the above-mentioned limitations, or to provide that which Hisashi lacks. This is also evidenced by the fact that Adlerstein was relied upon by the Examiner merely to supply the teaching of an air bridge.

In addition, Applicant respectfully notes that none of the cited references provides any *motivation or suggestion within the references themselves* for the references to be properly combined, nor is any motivation to combine appearing from the art or from the Examiner’s arguments.

In the instant Office Action (page 4, lines 11-13), the Examiner appears to be supplying a motivation based on that “Adlerstein et al. disclose an emitter electrode comprising a plurality of emitting elements...” Applicant respectfully notes that, the referenced “emitter” of Adlerstein is an *electron* emitter in the “emitter, base, and collector” assembly that comprises a bipolar transistor, and has nothing to do with a *light* emitting element. Because the emitter in Adlerstein is merely a component of a bipolar transistor, the emitter electrode *cannot possibly* comprise a plurality of “emitting elements” as asserted by the Examiner.

Thus, Adlerstein is distinctively aimed at solving different problems, *i.e.*, purely-electrical components that have nothing to do with light emission. By randomly choosing the reference Adlersten based on misinterpreted, isolated phrases such as “emitting elements” from a totally different context, without identifying a suggestion or motivation from within the references themselves (*see*, MPEP 2145 X(C), and MPEP 2143.01) or providing any *objective* reasons to combine the teachings of the references (*see*, MPEP 2143.01(IV)), it is clear that the Examiner, using the present application as a guide, has selected isolated features of the relied-upon references to arrive at the limitations of the claimed invention.

Use of the present application as a “road map” for selecting and combining prior art disclosures is wholly improper. *See Interconnect Planning Corp. v. Feil*, 774 F.2d 1132 (Fed. Cir. 1985) (stating that “[t]he invention must be viewed not with the blueprint drawn by the inventor, but in the state of the art that existed at the time”); *In re Fritch*, 972 F.2d 1260 (Fed. Cir. 1992) (stating that “it is impermissible to use the claimed invention as an instruction manual or ‘template’ to piece together the teachings of the prior art so that the claimed invention is rendered obvious... This court has previously stated that ‘one cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the

claimed invention.”); *In re Wesslau*, 353 F.2d 238 (C.C.P.A. 1965) (stating that “it is impermissible within the framework of section 103 to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art”).

In view of the above, Hisashi and Alderstein, whether considered separately or in combination, fail to show or suggest the claimed invention as recited in amended independent claim 1 of the present application. In addition, there is no motivation to combine Hisashi and Alderstein. Thus, claim 1 is patentable over Hisashi and Alderstein for at least the reasons set forth above. Claim 4 depends from claim 1 and, therefore, is also patentable over Hisashi and Alderstein for at least the same reasons. Accordingly, withdrawal of this rejection is respectfully requested.

Claims 6-9

Claims 6-9 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Hisashi. For the following reasons, this rejection is respectfully traversed.

As noted above, Hisashi fails to show or suggest at least the zigzag pattern. In the instant Office Action (page 5, lines 1-2), the Examiner admits that “Hisashi does not explicitly disclose that each group having an array of light emitting elements placed in a zigzag pattern.” However, the Examiner asserts that “it would have been an obvious matter of design choice to form each group having an array of light emitting elements placed in a zigzag pattern, since such a modification would have involved a mere change in the size or shape of a component.” In addition, the Examiner asserts that “the specification contains no disclosure of either the critical nature of the claimed dimensions of any unexpected results arising therefrom.” This is simply not true.

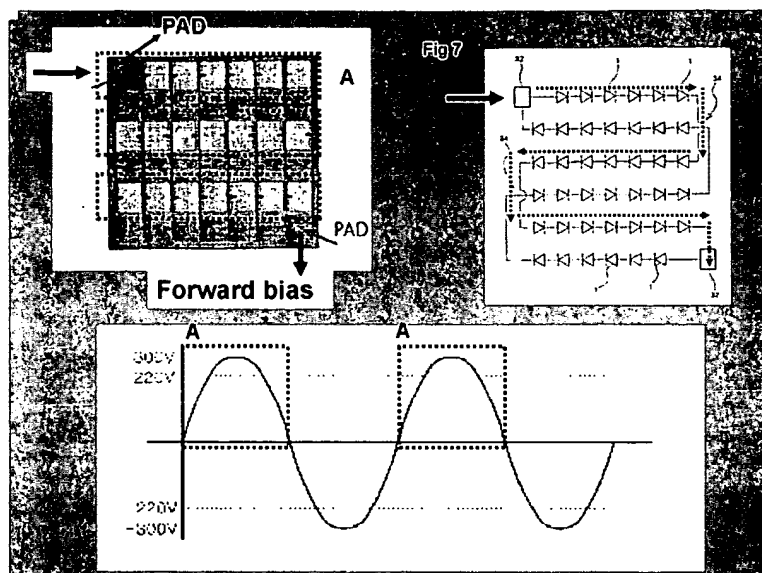
Referring to, *e.g.*, paragraph [0016] of the published application (Pub. No. 20050253151), reproduced below:

[0016] Various methods are available for two-dimensionally placing or arranging a plurality of light emitting elements, and a method which minimizes an area occupied on the substrate is desirable. For example, by arranging the two groups of light emitting element arrays in zigzag pattern, that is, arranging a plurality of light emitting elements on a bent line and alternately arranging the light emitting element arrays, the substrate area can be efficiently utilized and a large number of light emitting elements can be connected. When the two light emitting element arrays are alternately positioned, a crossing portion of lines may occur. It is possible to effectively prevent short-circuiting at the crossing portion by connecting the light emitting elements by air bridge lines ...

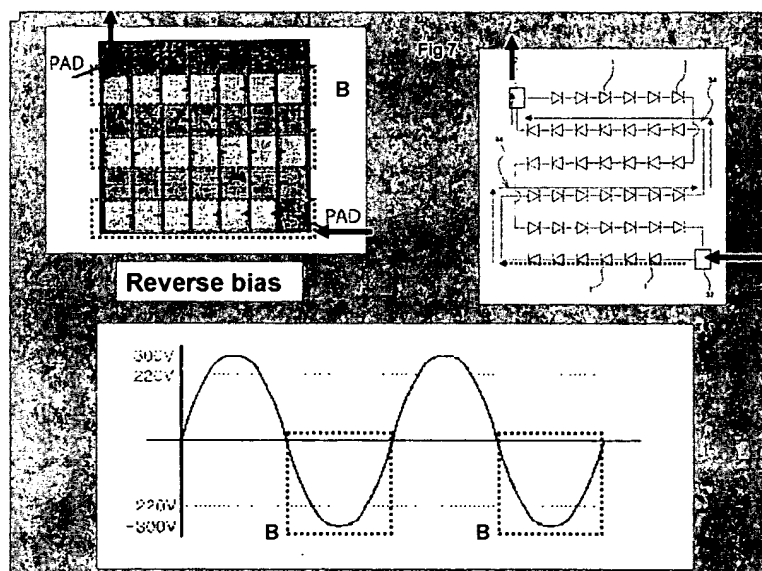
It is clear that, contrary to the Examiner's assertions, the zigzag pattern, as disclosed in the specification, is critical to the invention, and has resulted in many unexpected results that have not been shown or suggested in the cited prior art references, nor are known to those skilled in the art.

In addition, for a better understanding of the claimed invention, Applicant presents illustrative pictures of an actual device implemented according to one embodiment shown in Fig. 7.

The following pictures and diagrams show test results when an AC current is applied to the device. At forward bias with respect to the first group of light emitting elements (positive current in the AC current graph), the first group of light emitting elements are turned on.



At reverse bias with respect to the first group of light emitting elements, the second group of light emitting elements are turned on.



As can be clearly seen from the above, two groups of light emitting elements connected in series, each group of elements forming a zigzag pattern, enable the device to appear

to emit light more consistently and uniformly when an AC is applied because two groups of light emitting elements having different operating bias are interleaved alternately and well spread on the substrate. Applicant respectfully submits that such arrangement of light emitting elements and the unexpected results therefrom have not been shown or suggested in the cited references.

Paragraph [0060] further lists a number of advantages of the claimed arrangement of the light emitting elements:

[0060] ... each LED array is connected in series while bending in a zigzag pattern and two LED arrays have the zigzag shaped rows formed between the rows of the other LED array. By employing such a configuration, many LEDs 1 can be arranged on a small substrate 10. In addition, because only two electrodes 32 are required for 40 LEDs 1, the usage efficiency on the substrate 10 can be further improved. Moreover, when the LEDs 1 are individually formed in order to separate LEDs 1, the wafer must be cut for separation, but, in the present embodiment, the separation between LEDs 1 can be achieved through etching, which allows for narrowing of a gap between the LEDs 1. With this configuration, it is possible to further reduce the size of the sapphire substrate 10. The separation between LEDs 1 is achieved by etching and removing regions other than the LEDs 1 to the point which reaches the substrate 10 by using photoresist, reactive ion etching, and wet etching. Because the LED arrays alternately emit light, the light emission efficiency can be improved and heat discharging characteristic can also be improved. Moreover, by changing the number of LEDs 1 to be connected in series, the over all drive voltage can also be changed. In addition, by reducing the area of the LED 1, it is possible to increase the drive voltage per LED...

In view of the above, independent claim 6 is *not* obvious over Hisashi. Thus, claim 6 is patentable over Hisashi for at least the reasons set forth above. Dependent claims 7-9 are allowable for at least the same reasons. Accordingly, withdrawal of this rejection is respectfully requested.

Claims 12-13

Claims 12-13 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Hisashi in view of U.S. Patent No. 6,194,743 ("Kondoh"). For the following reasons, this rejection is respectfully traversed.

As noted above, Hisashi fails to show or suggest the claimed invention as recited in independent claim 1 of the present application. Kondoh, which is directed to a light emitting device containing a *single* light emitting element, also fails to show or suggest the above-mentioned limitations, or to supply that which Hisashi lacks. This is also evidenced by the fact that Kondoh was relied upon by the Examiner merely to supply an electrode for an alternate current power supply.

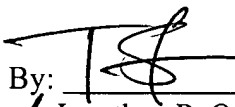
In view of the above, Hisashi and Kondoh, whether considered separately or in combination, fail to show or suggest the claimed invention as recited in amended independent claim 1 of the present application. Therefore, independent claim 1 is patentable over Hisashi and Kondoh for at least the reasons set forth above. Dependent claims 12-13 are patentable for at least the same reasons. Accordingly, withdrawal of these rejections is respectfully requested.

Conclusion

Applicant believes this reply is fully responsive to all outstanding issues and places this application in condition for allowance. If this belief is incorrect, or other issues arise, the Examiner is encouraged to contact the undersigned or his associates at the telephone number listed below. Please apply any charges not covered, or any credits, to Deposit Account 50-0591, Reference 08228/073001.

Dated: March 20, 2007

Respectfully submitted,

By:  #45,079
Jonathan P. Osha THOMAS SCHERER
Registration No.: 33,986
OSHA · LIANG LLP
1221 McKinney St., Suite 2800
Houston, Texas 77010
(713) 228-8600
(713) 228-8778 (Fax)
Attorney for Applicant